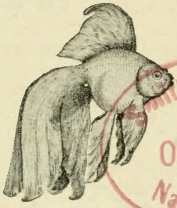
Aquarium Notes and News

OCTOBER, 1915



Issued by the
AQUARIUM SOCIETY OF
PHILADELPHIA

Vol. II No. 8

THE Aquarium Society of Philadelphia meets on the fourth Wednesday of each month, except July and August, at 1414 Arch Street.

Initiation fee, $2.00; dues $3.00 per year.

Corresponding membership, $1.00; no initiation.

"Notes and News" is sent to all members.

We have no subscription list and no paid advertisements, but members may use these columns subject to editorial approval, to tell what they want to buy or sell.

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October Meeting

The October meeting will be held on Wednesday evening, October 27th, No. 1414 Arch St.

At this meeting there will be a general auction of fish for the benefit of the society, the fish being presented by the different members.

The competition of the evening will be for the best fish owned by a member. There will be a diploma or silver medal for the best fish, and a bronze medal for the second best fish. We will also receive entries for the aquarium competition.

HOUSEHOLD AQUARIUM COMPETITION

All entries for the competition for household aquariums should be handed to the secretary not later than the next meeting.

Last year there was a greater number of aquariums to be examined and the judges informed the society that practically every one should have received honorable mention.

The increase in the interest in the household aquarium is very gratifying, and we hope this year that the number of entries will be at least double that of last year.

FAIRMOUNT PARK EXHIBITION

Owing to the fact that there is to be a large exhibition of fish in connection with the National Flower Show early next year, it was generally felt that there should be no show at Fairmount Park this Fall, but there have been so many requests to have it repeated that the Philadelphia societies have again appointed a committee to handle the project. The president of the committee is Mr. C. A. Provost, and the secretary Mr. Hiram Parker.

Permission to use Horticultural Hall has again been kindly given by the Fairmount Park Commissioners for the dates, October 30th, 31st and November 1st.

Owing to the probable cold weather at that season it is not expected that there will be such a large collection of tropical fish as last year, but there should be a very good lot of goldfish shown.

Members should tell their friends about this show and help in every way to make it another big success for the fish fanciers of Philadelphia.

THE SCIENTIFIC MANAGEMENT OF THE AQUARIUM

W. P. SEAL

(Continued from last issue.)

NOTE: The word "protococens" on page 68 in our previous issue should have been spelled "Protococcus."

There is no advantage in absorption of air from the surface. In fact it is more likely that vitiated or poisoned air will be thus introduced as water is a great absorbent of impurities from the atmosphere. A close fitting glass cover to prevent this and to keep out dust will be found to be a great advantage, where there is the necessary sunshine and efficient oxygenation. As the oxygen which is liberated in excess of what the water will hold in suspension will collect between the surface of the water and glass there will always be a highly oxygenated atmosphere above the water instead of one of possibly vitiated or poisoned air. The water will also evaporate and collect on the glass, constantly dripping back charged with oxygen, thus effecting further efficient oxygenation Used in this way, if properly stocked, the ordinary fish globe is as efficient as any other form of vessel.

There has always been much discussion as to the medium in which the plants should be rooted, some using pebbles, some sand or the two mixed, while by some clay and soils of various kinds are preferred. Notwithstanding the published results of experiments made in growing aquatic plants, I have, as a result of my own experiences and observation, for a long time doubted the necessity of using anything except sand for this purpose. It has seemed to me that the roots of aquatic plants are useful only in anchoring them and not as the means of nutrition. The growing tips of cabomba cut off from long stalks will, if weighted and dropped to the bottom, begin to grow before roots are thrown out, evidently taking nourishment directly from the water through the leaves and stalks. **Ceratophyllum** and **Utricularia** have no roots and yet grow luxuriantly if given the

necessary sunlight, which is vital to all of them. It is only reasonable to suppose that the elements of plant nutrition are diffused throughout water in which the decomposition of organic substances is going on, and that living in such a medium, absorption through the plant tissues would be the simplest provision for their sustenance.

Floating plants take their sustenance directly from the water through roots provided for that purpose though they are not anchored by them. Yet these roots will quickly grow into the soil if they can reach it. Why, therefore, should not the stalks and leaves of submerged plants take their nourishment directly from the water and not necessarily from soil?

Few people are able to grow cabomba though it is the plant in most general use. Yet in a properly conditioned aquarium it will root quickly and grow luxuriantly. It is true that in nature the most luxuriant growths of plants occur where there is mud or much sediment but may not that only mean that in such places, which are more or less stagnant, the water contains a greater proportion of nutritive elements? Plants in such places mature earlier and become ragged and unsightly while those growing in sand bars where there is some current are cleaner and brighter though apparently not of such vigorous growth. From one viewpoint this might appear to mean that where there is mud the roots must find more nutrition, or from another, that where water is more stagnant it contains a greater proportion of nutritive matter than where there is current. I can only argue the question from the standpoint of my own experience and not from careful experiment. At all events I have found sand to be the most satisfactory medium for growing aquatic plants and I have never found anything else necessary or desirable. Where there is the necessary sunlight to bring about the necessery chemical interactions there is no foulness and no unfavorable conditions.

There can be no rule established by which the number of fish that can be kept in a given

quantity of water can be determined as it depends on the varying conditions recorded above, and also the size and character of the fish, some of them requiring more oxygen than others, and large fish more than small ones.

It is a question that can only be settled by actual experiment in each individual case. Any attempt to establish a rule of so many fish to the gallon of water is the result of ignorance.

Many of the details of aquarium management are matters of individual preference and may be carried out in different ways with equally satisfactory results, but the fundimental requirement of ample sunlight cannot be disregarded without complete or partial failure.

With small aquaria some modifications of the sunlight may be found necessary during the hottest part of the day, but this is so easily arranged in various ways as to need no elucidation. If they are stocked with fishes of proper size and in due proportion there is no more difficulty than with large aquaria. I make use of jars of any size from a quart up, and a one gallon jar makes a good sized breeding aquarium for the small viviparous fishes, sufficing for a number of pairs.

It is not high temperature that causes distress to fishes, but lack of oxygen resulting from it. I have kept large trout of various species at temperatures ranging from 70 to 80 degrees F. without evidences of discomfort, but this, of course, in artificially aerated water. It is probable that they could be adapted by degrees to live in an ordinary aquarium, and this I suggested many years ago.

In a letter written to me in 1912 by Mr. Fred Metcalf, he tells of an experiment he made in keeping two trout fry in a nature aquarium, viz: "These two fry, which had been hatched in the wild state were placed by themselves in a fifty gallon aquarium of perfectly stagnant water with no mode of aeration whatever except that due to a luxuriance of thriving plant growths. Living food was profusely abundant in the form of multitudes of protozoans and minute crustaceans, upon which they fed constantly. I was able to keep them for several weeks, during

which time they grew from about seven eighths of an inch to perhaps an inch and three eighths in length, and became very plump, vigorous and much more active and able-bodied than at first. During the month of June the weather became gradually very hot; and as my tanks were so situated that I was unable to give them the advantage of the cooling night air, the temperature of the water rose day by day until it reached 80 degrees. Up to that temperature, much to my surprise, the trout had remained perfectly strong and vigorous. Finally however, when the temperature of the water had passed 81 and was approaching 82 degrees, I found one of the trout dead and the other swimming in circles at the surface. Had I been able to properly cool the room at night I am satisfied that I might have kept those trout in excellent condition throughout the summer. I doubt whether this species has ever before been maintained in health in stagnant water for an entire week during which the water temperature advanced from 70 to 80 degrees. And I am inclined to the belief that with super-abundant oxygen from vigorous growing plants, and a sufficient supply of their natural food, our native brook trout, the most sensitive to high temperature of all our fishes, may be maintained indefinitely in stagnant water up to 75 degrees. This suggests a matter which I have never seen referred to in any book or article on aquaria, but which I have had constantly in mind in my own experiments; that is, the possible complete balance of the entire life relations of a tank, inclusive of food supply.

In the case I have described such a balance existed. Owing to the large area of the tank, dense cover afforded by plants, and reduced stocking of fish, the minute life was multiplying faster than the two trout were able to capture and consume it. In such a relation we have, not merely the crude balance of animal life to the aerating power of the plants, but a finer and more beautiful balance between the fishes and the food supply; a balance which is quite possible of maintainance during the summer season, at least, when the minute forms of life multiply

rapidly, and a condition exists in which the aquarium may be left absolutely alone to the undisturbed processes of nature.

You are writing occasionally upon these subjects. Why do you not recommend the attempt to maintain aquaria after this manner to those who have graduated beyond the primitive ambition to behold a tank filled with a multitude of fish ?"

This experiment illustrates the fact that there is no balance of forces in the adjustment of the relations of plant and animal life, in the proper meaning of the word, but that on the contrary there must be a preponderance on the one side. It illustrates also the operation of the principles I have advocated in this article. For many years my endeavor has been to bring about such a general appreciation of the possibilities in the use of aquaria, especially where used for biological research, but I have long given up hope of witnessing such a developement. I have suggested a number of possibilities in this direction and I can claim to have influenced a few advances, but it is not in the power of anyone to hasten progress except in the direction of sport or war, or the making of money. It is only in these directions that he can get a hearing. In any other the human mind moves sluggishly.

Aquariums are being built as adjuncts of biological laboratories for the alleged purpose of unfolding the life histories and inter-relations of plant and animal life, but there is not in the world today a great aquarium where the fundimental principles and requirements outlined by Mr. Metcalf are given consideration. They are merely holding receptacles for material that is constantly being collected and cut into sections for physiological and anatomical investigation. Nor can there be anything better expected in this direction until competant men are selected for such work instead of those who are only selected through political or other influences in place of natural abilities. At present only the spectacular is considered in the developement of great aquaria, the managerie, whale-in-a-bath-tub principle.